

REMARKS

Claims 1-7, 9-10, 12-14, and 17-19 are currently pending. Claims 1 and 10 have been amended to more clearly set forth the subject matter of the invention. Claims 9 and 19 have been amended to independent form including all limitations of the claims from which they previously depended.

SECTION 112

Claims 1-7, 9, 10, 12-14, and 17-19 have been rejected under 35 U.S.C. §112, first paragraph for failing to comply with the written description requirement for including the phrase, "wherein the polymer is substantially free of polyamine chain extenders." Applicants respectfully submit that this rejection has been obviated by the amendment of this phrase in claims 1 and 10 to read, "wherein the polymer omits polyamine chain extenders." Support for this amendment is found at page 9, lines 7-8 of the specification. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

Claims 1-7, 9, 10, 12-14, and 17-19 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicants regard as the invention for inclusion of the term "substantially free". Applicants respectfully submit that the deletion of the term "substantially free" from claims 1 and 10 obviates this ground of rejection. Therefore, reconsideration and withdrawal of this rejection is respectfully requested.

DOUBLE PATENTING

Claims 1-7, 9, 10, 12-14, and 17-19 have been provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-19 of copending application No. 10/700,857. Applicants will consider the timely filing of a terminal disclaimer upon a finding of allowable subject matter.

SECTION 102

Claims 1-7, 10, 12-14, 17 and 18 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,008,325 to Soto et al. ("Soto"), similarly, claims 1-7, 10, 12-14, 17 and 18 have been rejected as being anticipated by U.S. Patent No. 5,037,864 to Anand et al. ("Anand"). Each of these rejections will be addressed below.

Claim 1 as amended includes a urea/urethane polymer consisting essentially of (a) repeating units derived from a hydroxy-terminated copolymer prepared from tetrahydrofuran and one or both of an alkylene oxide and a cyclic acetal, and (b) repeating units derived from a polyisocyanate. The urea/urethane polymer contains less than about 2 mole percent of urea units described by the formula $-R - N(R^2) - C(O) - N(R^2) - R^1 -$; where R is an aromatic hydrocarbon radical, R¹ is an aliphatic hydrocarbon radical, and R² is H or an amide group that is described by the formula $-C(O) - N(R^2) - R -$. The polyisocyanate is selected from aromatic polyisocyanates and mixtures thereof. The urea/urethane polymer also includes repeating units derived from an ionic compound or a potentially ionic compound and omits polyamine chain extenders.

The urea/urethane polymer of claim 1 is useful in an aqueous dispersion given its ionomeric nature and may be used to prepare thin walled articles such as gloves that will have direct contact with a wearer's skin. Of particular importance, the urea/urethane polymer will only include the urea component where R¹ is aliphatic when (1) an aliphatic polyamine is used as a chain extender or (2) water is used as a chain extender with an aliphatic isocyanate. Polyamine chain extenders are avoided in the present invention due to the wearer contact end uses where polyamines can cause skin irritation.

Also of importance to note is that the present invention includes an aromatic polyisocyanate. Aromatic polyisocyanates were previously avoided in the preparation of polyurethane dispersion due to the belief that the use of an aliphatic isocyanates were thought to have higher stability toward hydrolysis while the prepolymer is dispersed in water. It was generally believed that, in such a situation, a chain-extending reaction between an isocyanate and a polyamine takes place in a more controlled and predictable manner. For the present invention, only aromatic polyisocyanates are included.

Soto

Claims 1-7, 10, 12-14, 17 and 18 have been rejected under 35 U.S.C. §102(b) as anticipated by Soto. Applicants respectfully submit that the amendment of claims 1 and 10 obviates these rejections.

Soto is directed to polyurethane-urea resins with incorporated hydrophobic microparticle fillers. Soto teaches two methods by which this is accomplished at Column 4, lines 53-60:

This is advantageously done by substituted a copolymer polyol for all or a portion of the polyol component used in the making the polyurethane-urea. Alternatively, a particulate hydrophobic polymer having isocyanate-reactive groups at least on the surface of the particles can be prepared in a separate step and combined with a polyol for reaction with a polyisocyanate.

Soto prefers the former method where the copolymer polyol includes the hydrophobic monomer which may be vinyl, vinylidene halides and vinyl aromatic monomers.

Soto fails to include several elements of the claims as amended. Soto requires the use of the copolymer including the hydrophobic monomer. Even though this copolymer may be combined with a copolymer of tetrahydrofuran and ethylene oxide or propylene oxide, Soto fails to teach a urea/urethane polymer consisting essentially of (a) repeating units derived from a hydroxy-terminated copolymer prepared from tetrahydrofuran and one or both of an alkylene oxide and a cyclic acetal, and (b) repeating units derived from a polyisocyanate because Soto requires the inclusion of the hydrophobic monomer.

Moreover, Soto provides no disclosure, teaching or suggestion as to the element limiting the urea units to less than about 2 mole percent of a group having R¹ as an aliphatic hydrocarbon radical. Soto also fails to disclose a polymer that omits polyamine chain extenders.

Given that Soto fails to disclose every element of the present claims because Soto requires the inclusion of a hydrophobic monomer in the polymer and fails to disclose the preparation of a polymer that omits polyamine chain extenders and the urea groups which limit R¹ as an aliphatic hydrocarbon radical, Soto fails as a proper anticipatory reference with respect to the present claims. Therefore, reconsideration and withdrawal of the rejections under Section 102 in view of Soto are respectfully requested.

Anand

Claims 1-7, 10, 12-14, 17 and 18 have been rejected under 35 U.S.C. §102(b) as anticipated by Anand. Applicants respectfully submit that the amendment of claims 1 and 10 obviates these rejections.

Anand fails to disclose every element of the claims as amended. Specifically, Anand fails to disclose the preparation of a polymer that omits a polyamine chain extender, fails to disclose the limitation of the urea groups which include R¹ as an aliphatic hydrocarbon radical, and fails to disclose a polyisocyanate selected from the group consisting of aromatic polyisocyanates and mixtures thereof.

With respect to the polyisocyanate, Anand requires, “an excess of an aliphatic or cycloaliphatic diisocyanate, or mixture of an aliphatic or cycloaliphatic diisocyanate with an aromatic isocyanate.” Anand’s Abstract. Present claim 1 as amended requires that the polyisocyanate consist of an aromatic polyisocyanate. Anand requires a combination of aliphatic and aromatic isocyanate and, therefore, does not anticipate the use of an aromatic isocyanate alone.

Given that Anand fails to disclose every element of the present claims, including the preparation of a polymer that omits polyamine extenders and the limitation of the urea groups which include R¹ as an aliphatic hydrocarbon radical, and a polyisocyanate which consists of an aromatic isocyanate, Anand fails as a proper anticipatory reference with respect to the present claims. Therefore, reconsideration and withdrawal of the rejections under Section 102 in view of Anand are respectfully requested.

SECTION 103

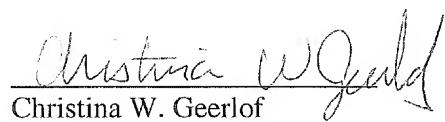
Claims 9 and 19 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Soto or Anand in view of U.S. Patent No. 3,178,310 to Berger et al. (“Berger”.) Applicants respectfully submit that this rejection is obviated by the amendment of claim 1 and 10 which are now included in 9 and 19, respectively as they have been amended to independent form. Berger has only been cited to show the use of a surfactant in combination with a polyurethane dispersion. However, Berger does not provide any disclosure, teaching or suggestion to overcome the deficiencies of either Soto or Berger in disclosing every element of the claims as amended. Therefore, withdrawal of the rejections of claims 9 and 19 under Section 103 is respectfully requested.

CONCLUSION

For the reasons stated above, claims 1-7, 9-10, 12-14, and 17-19 are believed to be in condition for allowance. Accordingly, Applicants respectfully request that the Application be allowed. If prosecution may be further advanced, the Examiner is invited to telephone the undersigned to discuss this application.

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Respectfully submitted,



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